



5th International Symposium on
Applied Engineering and Sciences (SAES2017)
14th–15th November 2017 | MALAYSIA
UNIVERSITI PUTRA MALAYSIA, SERDANG, SELANGOR



Poster code:

B17

Engineering lipase for structure and function relationship study

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Abstract. Lipase has long been recognized as one the most important industrial enzymes and bring about a diverse range of bioconversion reactions in both aqueous and non-aqueous media. The various biotechnological potential of lipase especially those of microbial origins are associated with their intrinsic properties such as stability in various pH and temperature, and the ability to remain active in various organic solvents. Despite their industrial potentials, natural enzymes are often not suitable for biocatalytic processes, hence knowledge on the structure and function correlation is important to manipulate the enzymes to suit the industrial needs. Previously, an organic solvent stable bacteria producing lipase was isolated from a car service area. This lipase exhibited high activity and stability in alkaline pH, low temperature and a wide range of organic solvents. In this work, strategies were conducted using computational and prediction tools in order to identify the key features responsible for the enzyme's stability. Knowledge gained could be useful in lipase engineering study.

Keywords: lipase, industrial enzyme, lipase engineering